

**REMARKS**

Claims 1-21 were originally filed in the present application.

Claims 1, 9 and 17 were previously cancelled.

Claims 2, 3, 10, 11, 18 and 19 were previously amended.

Claims 22-24 were previously added.

Claims 2-8, 10-16, and 18-24 remain in the present application. Reconsideration of the claims is respectfully requested.

The Applicant previously filed an appeal brief in the present application. In the Board's Decision on Appeal mailed August 13, 2004, the Board reversed the rejections of Claims 2-8, 10-16 and 18-24. The Examiner has now rejected Claims 2-8, 10-16 and 18-24 based on a new prior art reference.

In Sections 2 and 3 of the December 7, 2004 Office Action, the Examiner rejected Claims 2-8, 10-16 and 18-24 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 5,926,816 to *Bauer et al.* (hereafter, simple "*Bauer*") in view of the article "A Formal Approach to Recovery by Compensating Transactions", *Levy et al.*, Proceedings of the 16<sup>th</sup> VLDB Conference, 1990, pages 95-106 (hereafter, simple "*Levy*"). Regarding independent Claims 2, 10 and 18, the Examiner asserted that the *Bauer* reference disclosed substantially all of the limitations of Claims 2, 10 and 18, with the exception that the *Bauer* reference does not explicitly disclose "the limitation of the server and client operating substantially concurrently". The Examiner further asserted, however, that Figures 6A and 6B of the *Bauer* reference and the text at column 4, lines 40-55, and column 11,

line 23, to column 13, line 60, teach that proper synchronization should be frequently verified in the communication between client and server. Thus, according to the Examiner, the limitation regarding the server and client operating substantially concurrently is therefore inherent.

The Examiner further asserted that, even if the *Bauer* reference falls short, the *Levy* reference nonetheless discloses the missing limitation regarding the server and client operating substantially concurrently. In particular, the Examiner asserted that the *Levy* reference discloses “a compensating transaction system that has some special characteristics such as concurrently executing transactions in order to conform consistency constraints (See *Levy*, Section 2, Overview of Compensation, pg. 96). The Examiner concluded that it would have been obvious to combine the *Bauer* reference and the *Levy* reference to arrive at the claimed invention.

The Applicant respectfully disagrees with the Examiner’s rejections of Claims 2-8, 10-16 and 18-24 and directs the Examiner’s attention to Claim 2, which recites the unique and non-obvious limitation emphasized below:

2. (Previously Presented) A data synchronization apparatus for maintaining synchronization between a source data file and a copy data file comprising:

a bulk copy controller capable of copying a plurality of data records from said source data file to said copy data file; and

an update controller capable of detecting a change in a data record previously copied by said bulk copy controller from said source data file to said copy data file and copying said changed data record from said source data file to said copy data file, wherein said update controller and said bulk copy controller operate substantially concurrently. (emphasis added)

The Applicant respectfully asserts that the above-emphasized limitations are not disclosed, suggested, or even hinted at, in the *Bauer* reference or the *Levy* reference, or in the combination of the *Bauer* reference and the *Levy* reference.

The Applicant respectfully disagrees with the Examiner's assertion regarding the inherency of the limitation regarding the server and client operating substantially concurrently. The Applicant notes that statement in the *Bauer* reference that "proper synchronization should be frequently verified" (column 4, lines 41 and 42) has no bearing on whether or not the server and client operate substantially concurrently. If the verification process occurs after the copy process has completed, the two processes are sequential, not concurrent, even if the two processes occur often.

Moreover, the Applicant respectfully asserts that the *Levy* reference does not disclose or even hint at the Claim 2 limitation that the update controller and the bulk copy controller operate substantially concurrently. In fact, the portion of the *Levy* reference relied upon by the Examiner appears to be wholly unrelated to such a limitation. The first two paragraphs of Section 2, "Overview of Compensation," of the *Levy* reference state:

When the updates of a (committed or uncommitted) transaction  $T$  are read by some other transaction, we say that  $T$  has been externalized. The sole purpose of compensation is to handle situations where we want to undo an externalized transaction  $T$ , without resorting to cascading aborts. We refer to  $T$  as the compensated-for transaction. The transactions that are affected by (reading) the data values written by  $T$  are referred to as dependent transactions (of  $T$ ), and are referred to as a set using the notation  $\text{dep}(T)$ . The key point of our recovery paradigm is that we would like to leave the effects of the dependent transaction intact while preserving the consistency of the database, when undoing the compensated-for transaction. Compensation undoes  $T$ 's effects in a semantic manner, rather than by physically restoring a prior state. All that is guaranteed by compensation is that a

consistent state is established based on semantic information. This state may not be identical to the state that would have been reached, had the compensated-for transaction never taken place.

We propose the notion of compensating transactions as the vehicle for carrying out compensation. We use the notation *CT* to denote the compensating transaction for transaction *T*. A compensating transaction has the fundamental properties of a transaction along with some special characteristics. It appears atomic to a concurrently executing transactions (that is, transactions do not observe partially compensated states); it conforms to consistency constraints; and its effects are durable. However, a compensating transaction is a very special type of transaction. Under certain circumstances, it is required to restore consistency, rather than merely preserve it. It is durable in the strong sense that once a decision is made to initiate compensation, the compensating transaction must complete, since it does not make any sense to abort it. The choice of either to abort or to commit is present for the original transaction. A compensating transaction offers the ability to reverse this choice, but we do not go any further by providing the capability to abort the compensation. There are other special characteristics. Above all, a compensating transaction does not exist by its own right; it is always regarded within the context of the compensated-for transaction. It is always executed after the compensated-for transaction. Its actions are derivative of the actions of the compensated-for and the dependent transactions. In some situations, the actions of a compensating transaction can be extracted automatically from the program of the compensated-for transaction, the current state of the database, and the current state of the log. In other situations, it is the system programmer's responsibility to pre-define a compensating transaction.

The Applicant respectfully asserts that the "compensation" process described above has nothing to do with the synchronization process recited in Claim 2. The third paragraph of Section 2 of the *Levy* reference goes on to give a "mundane" example that exemplifies a compensation process:

Consider a database system that deals with transactions that represent purchasing of goods. Consider the act of a customer returning goods after they have been sold. The compensated-for transaction in that case is a particular purchase, and the compensating transaction encompasses the activity caused by the cancellation of the purchase. . . The actual compensation depends on the relevant policy. . . Whether to cancel the order from the supplier and whether to retain the customer in the mailing list are other application-dependent issues with which the compensating transaction must deal. (emphasis added)

The Applicant notes that not only are the compensated-for transaction (purchase of goods) and the compensating transaction (return of goods) discussed in the *Levy* reference not concurrent, they are substantially separated in time. In sum, the *Levy* reference does overcome the shortcomings of the *Bauer* reference with respect to the Claim 2 limitation that the update controller and the bulk copy controller operate substantially concurrently.

This being the case, Claim 2 presents patentable subject matter over the *Bauer* reference and the *Levy* reference, either individually or in combination. Also, Claims 3-8 depend from Claim 2 and contain all of the unique and non-obvious limitations recited in Claim 2. This being the case, Claims 3-8 are patentable over the *Bauer* reference and the *Levy* reference, either individually or in combination.

Furthermore, independent Claims 10 and 18 recite limitations that are analogous to the unique and non-obvious limitations recited in Claim 2. Claims 10 and 18 are therefore patentable over the cited prior art references. Finally, Claims 11-16, which depend from Claim 10, and Claims 19-24, which depend from Claim 18, contain all of the unique and non-obvious limitations recited in Claims 10 and 18, respectively. This being the case, Claims 11-16 and Claims 19-24 are patentable over the *Bauer* reference and the *Levy* reference, either individually or in combination.

**SUMMARY**

For the reasons given above, the Applicant respectfully requests reconsideration and allowance of pending claims and that this Application be passed to issue. If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this Application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at *jmockler@davismunck.com*.

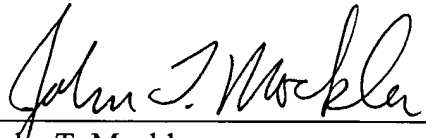
The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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